AMENDMENTS

IN THE CLAIMS

Please cancel claims 1-49, 73-84, and 91-97, without prejudice.

Please add the following new claims:

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--98. (New) A sensor, comprising:

at least two conductive leads;

a sensing area comprising alternating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte, wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a highly doped semi-conductor, or a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases; and

an apparatus in electrical communication with the conductive leads for detecting a change in the sensing area between the at least two conductive leads when contacted with an analyte.

99. (New) The sensor according to claim 98, wherein the conductive organic material is selected from the group consisting of a polyaniline, an emeraldine salt of polyaniline, a polypyrrole, a polythiophene, a polyEDOT, and derivatives thereof.

100. (New) The sensor according to claim 98, wherein the compositionally different conductive material is carbon black.

101. (New) The sensor according to claim 98, further comprising an insulator or plasticizer.

102. (New) The sensor of claim 98, wherein the conductive organic material is an emeraldine salt of polyaniline and the compositionally different conductive material is carbon black.

103. (New) The sensor of claim 98, wherein the conductive organic material is a doped polyaniline and the compositionally different conductive material is carbon black.

104. (New) A sensor, comprising:

at least two conductive leads;

a sensing area comprising alternating interpenetrating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte, wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a highly doped semi-conductor, or a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases; and

an apparatus in electrical communication with the conductive leads for detecting a change in the sensing area between the at least two conductive leads when contacted with an analyte.

105. (New) A sensor, comprising:

at least two conductive leads;

a sensing area comprising dispersed regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte, wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a highly doped semi-conductor, or a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increases; and

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an apparatus in electrical communication with the conductive leads for detecting a change in the sensing area between the at least two conductive leads when contacted with an analyte.

106. (New) A sensor, comprising:

at least two conductive leads;

a sensing area comprising alternating regions of a polyaniline or an emeraldine salt of polyaniline and a conductive material compositionally different than the polyaniline or emeraldine salt of polyaniline disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides

an electrical path through the regions of polyaniline or emeraldine salt of polyaniline and the conductive material compositionally different than the polyaniline or emeraldine salt of polyaniline and wherein the area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte; and

an apparatus in electrical communication with the conductive leads for detecting a change in the sensing area between the at least two conductive leads when contacted with an analyte.

107. (New) The sensor of claim 106, wherein the conductive material compositionally different than the polyaniline or emeraldine salt of polyaniline is selected from the group consisting of an organic conductor, an organic complex, an inorganic conductor, and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a highly doped semi-conductor, an oxidized metal, a superconductor, and any combination thereof.

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108. (New) A sensor array comprising:

a plurality of sensors, wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte.

109. (New) The sensor array according to claim 108, wherein the sensor array comprises a plurality of sensors each comprising regions of a conductive organic material and regions of a conductive material compositionally different than the conductive organic material wherein the conductive organic material of at least one sensor is different from the conductive organic material of at least one other sensor.

110. (New) The sensor array according to claim 108, wherein the compositionally different conductive material is an inorganic conductor.

111. (New) The sensor array according to claim 108, wherein the first and/or second response is a change in resistance in the at least one sensor.

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112. (New) The sensor array according to claim 108, wherein the conductive organic material of the at least one sensor is compositionally the same or compositionally different.

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113. (New) The sensor array according to claim 108, wherein the conductive organic material is selected from the group consisting of a polyaniline, an emeraldine salt of polyaniline, a polypyrrole, a polythiophene, and a polyEDOT, and the conductive material compositionally different than the conductive organic material is selected from the group consisting of Ag, Au, Cu, Pt, carbon black, and AuCu.

114. (New) The sensor array according to claim 108 or 113, further comprising a temperature control apparatus in thermal communication with at least one sensor.

115. (New) The sensor array according to claim 108 or 113, wherein the first and/or second response is a change in an electrical impedance.

116. (New) The sensor array according to claim 115, further comprising a temperature control apparatus in thermal communication with at least one sensor.

117. (New) The sensor array according to claim 110, wherein the inorganic conductor is a member selected from the group consisting of Ag, Au, Cu, Pt, carbon black, and AuCu.

118. (New) The sensor array according to claim 110, wherein the inorganic conductor is carbon black.

119. (New) The sensor array according to claim 108, wherein the compositionally different conductive material is an organic conductor.

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120. (New) The sensor array according to claim 108, wherein the conductive material compositionally different than the conductive organic material is a member selected from the group consisting of an organic conductor, an inorganic conductor, and a mixed inorganic-organic conductor.

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121. (New) The sensor array according to claim 108, wherein the conductive material compositionally different than the conductive organic material is a member selected from the group consisting of a metal, a metal alloy, a metal oxide, an organic complex, a semiconductor, a superconductor, and a mixed inorganic-organic complex.

122. (New) The sensor array according to claim 108, wherein the compositionally different conductive material is a particle.

123. (New) The sensor array according to claim 108, wherein the compositionally different conductive material of each of the sensors comprises a conductive organic material.

124. (New) The sensor array according to claim 108, wherein the alternating regions of the conductive organic material and the conductive material compositionally different than the conductive organic material are interpenetrating regions conductive organic material and conductive material compositionally different than the conductive organic material.

125. (New) The sensor array according to claim 108, further comprising:

a measuring apparatus in communication with at least one sensor of the plurality of sensors.

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126. (New) A sensor array comprising:

a plurality of sensors, wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating interpenetrating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, wherein the compositionally different conductive material is selected from the group consisting of an organic conductor, an organic complex, and inorganic conductor, and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal having electrical conductivity that decreases as the temperature increases, a metal alloy, a highly doped semi-conductor, or a superconductor, or a combination thereof, the sensor constructed to provide a first response when contacted with a first chemical analyte, and a second different response when contacted with a second different chemical analyte; and

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a measuring apparatus electrically coupled to the at least two conductive leads for detecting a change in the sensing area when contacted with an analyte.

127. (New) A sensor array comprising:

a plurality of sensors wherein at least one sensor comprises alternating interpenetrating regions of a conductive organic material and regions of a compositionally different conductive material; and

means, electrically coupled to the plurality of sensors, for detecting a change in the plurality of sensors when contacted with an analyte.

128. (New) A sensor array system comprising:

a plurality of sensors, wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material, and wherein the sensing area provides a first response when contacted with a first analyte, and a second different response when contacted with a second different analyte;

a measuring apparatus, wherein the at least one sensor is in communication with the measuring apparatus; and

a computer comprising a resident algorithm, wherein the computer processes the difference between the first response and the second response.

129. (New) The sensor array system according to claim 128, wherein the measuring apparatus is an electrical measuring device.

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130. (New) The sensor array system according to claim 128, wherein the compositionally different conductive material is an inorganic conductor.

131. (New) The sensor array system according to claim 128, wherein the plurality of sensors each comprise regions of a conductive organic material and regions of a conductive material compositionally different than the conductive organic material.

132. (New) The sensor array system according to claim 131, wherein the conductive organic material of at least one sensor is different from the conductive organic material of at least one other sensor.

133. (New) The sensor array system according to claim 131, wherein the conductive organic material of the plurality of sensors are compositionally the same or compositionally different.

134. (New) The sensor array system according to claim 128, wherein the first and/or second response is a change in resistance in the sensors.

135. (New) The sensor array system according to claim 128, wherein the conductive organic material is selected from the group consisting of a polyaniline, an emeraldine salt of polyaniline, a polypyrrole, a polythiophene, and a polyEDOT, and the conductive material compositionally different than the conductive organic material is selected from the group consisting of Ag, Au, Cu, Pt, carbon black, and AuCu.

136. (New) The sensor array system according to claim 128 or 135, further comprising a temperature control apparatus in thermal communication with at least one sensor.

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137. (New) The sensor array system according to claim 128 or 135, wherein the first and/or second response is a change in an electrical impedance.

138. (New) The sensor array system according to claim 137, further comprising a temperature control apparatus in thermal communication with at least one sensor.

139. (New) The sensor array system according to claim 130, wherein the inorganic conductor is a member selected from the group consisting of Ag, Au, Cu, Pt, carbon black, and AuCu.

140. (New) The sensor array system according to claim 130, wherein the inorganic conductor is carbon black.

141. (New) The sensor array system according to claim 128, wherein the compositionally different conductive material is an organic conductor.

142. (New) The sensor array system according to claim 128, wherein the conductive material compositionally different than the conductive organic material is a member selected from the group consisting of an organic conductor, an inorganic conductor, and a mixed inorganic-organic conductor.

143. (New) The sensor array system according to claim 128, wherein the conductive material compositionally different than the conductive organic material is a member selected from the group consisting of a metal, a metal alloy, a metal oxide, an organic complex, a semiconductor, a superconductor, and a mixed inorganic-organic complex.

144. (New) The sensor array system according to claim 128, wherein the compositionally different conductive material is a particle.

145. (New) The sensor array system according to claim 128, wherein each of the sensors comprises a conductive organic material.

146. (New) The sensor array system according to claim 128, wherein the conductive organic material is an organic polymer.

147. (New) The sensor array system according to claim 128, wherein the resident algorithm is a member selected from the group consisting of principal component analysis, Fisher linear analysis, neural networks, genetic algorithms, fuzzy logic, pattern recognition, and combinations thereof.

148. (New) A system for identifying a microorganism, the system comprising:

a measuring apparatus;

a sensor array comprising ~~a~~ plurality of sensors in communication with the measuring apparatus, wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between and in electrical communication with the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material; and

a computer comprising a resident algorithm;

wherein the measuring apparatus is capable of detecting a response from each sensor in the array wherein the responses are indicative of the presence of a biomarker of a microorganism and the computer is capable of assembling the responses into a response profile whereby the computer associates the response profile indicative of the biomarker with a microorganism for microorganism identification.

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149. (New) The system for identifying a microorganism in accordance with claim 148, wherein the resident algorithm of the computer is a member selected from the group consisting of principal component analysis, Fisher linear analysis, neural networks, genetic algorithms, fuzzy logic, pattern recognition, and combinations thereof.

150. (New) The system for identifying a microorganism in accordance with claim 148, further comprising the steps of:

providing an information storage device coupled to the measuring apparatus; and

storing information in the information storage device.

151. (New) The system for identifying a microorganism in accordance with claim 148, wherein the measuring apparatus includes a digital-analog converter.

152. (New) A system for detecting ~~an~~ analyte in a sample, comprising:

a substrate having a plurality of sensors wherein at least one sensor comprises:

at least two conductive leads;

a sensing area comprising alternating regions of a conductive organic material and a conductive material compositionally different than the conductive organic material disposed between, and in electrical communication with, the at least two conductive leads, wherein the sensing area provides an electrical path through the regions of the conductive organic material and the regions of the compositionally different conductive material such that the at least one sensor provides a response that varies according to the presence of an analyte in contact with it;

a detector operatively associated with the plurality of sensors, for measuring the response of the plurality of sensors when contacted with the sample;

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a sample delivery unit for delivering the sample to be tested to the plurality of sensors; and

an information storage and processing device configured to store an ideal response for a predetermined analyte and to compare the response of the plurality of sensors with the stored ideal response, to detect the presence of the analyte in the sample.

153. (New) The system in accordance with claim 152, wherein the information storage and processing device is configured to store ideal responses for a plurality of predetermined analytes; and

the information storage and processing device further is configured to compare the response of the plurality of sensors with the plurality of stored ideal responses, to detect the presence of each analyte in the sample.

154. (New) The system in accordance with claim 152, wherein the sample is a liquid and the sample delivery unit comprises:

a flow passage interconnecting the substrate comprising the plurality of sensors with a mixture containing the liquid;

a gas-permeable, liquid-impermeable shield interposed in the flow passage; and

a device for extracting vapor from the liquid and for delivering the extracted vapor along the flow passage to the substrate comprising the plurality of sensors via the flow passage.

155. (New) The system in accordance with claim 152, wherein the sample is gaseous and the sample delivery unit comprises:

a gas flow passage; and

a pump for pumping the gaseous sample to the substrate comprising the plurality of sensors via the gas flow passage.

156. (New) The system in accordance with claim 152, wherein the sample is a vapor extracted from a solid and the sample delivery unit comprises:

a vapor flow passage; and

a pump for pumping the vapor extracted from the solid to the substrate comprising the plurality of sensors via the vapor flow passage.

157. (New) The system in accordance with claim 152, wherein the detector detects a member selected from the group consisting of electromagnetic energy, optical properties, resistance, capacitance, inductance, impedance, and combinations thereof.

158. (New) The system in accordance with claim 152, wherein at least one other sensor in the plurality of sensors comprises a member selected from the group consisting of a surface acoustic wave sensor; a quartz microbalance sensor; a conductive composite; a chemiresistor; a metal oxide gas sensor; a conducting polymer sensor; a dye-impregnated polymer film on fiber optic detector; a polymer-coated micromirror; an electrochemical gas detector; a chemically sensitive field-effect transistor; a carbon black-polymer composite; a micro-electro-mechanical system device; and a micro-opto-electro-mechanical system device.--

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IN THE DRAWINGS

Please replace the existing Figure 1 in the present application, with the attached new Figure 1 (attached hereto as Appendix A).